

Audit fee determinants in the Belgian health care sector

Dave Vanderbeke, Johan Christiaens, Sandra Verbruggen^{*}

Abstract

External audit fees have been an important research topic over the last decades. Ever since Simunic (1980) - who was one of the first researchers of the explanatory factors of audit fees - a number of studies have been performed considering the profit sector (DeAngelo, 1981; Palmrose, 1986; Willekens & Gaermynck, 2005). More recently, the non-profit segment of the market has been investigated as well. Both in main context (Vermeer et al., 2010; Verbruggen et al., 2011) as in specific subsectors (Beattie et al., 2001; Mellett et al., 2007) non-profit audit studies have been performed. Verbruggen et al. (2011) attempted to explain the audit fee of 740 Belgian non-profit organizations. Differing circumstances (lower litigation risks, lower agency problems, no shareholders, ...) may explain differences between the profit and non-profit sector (cf. negative relationship between fee and specialization). Moreover the effect on audit fees also appears to depend on the sector the non-profit organization belongs to. However, as far as we know the health care sector - while being a very important part of the non-profit sector - has never been the subject of an audit fee study. Therefore, the current paper focuses on the Belgian health care sector and investigates the impact of its typical characteristics on the audit fee. A number of hypotheses derived from previous research in the profit sector as well as for non-profit research in general are developed and are extended by hypotheses regarding specific hospital characteristics. Do the number of hospital services and the legal status of the organization drive the complexity of a hospital audit? Especially the last part of this question makes this research most interesting. What about overhead costs in social welfare hospitals and university hospitals? Do they make the audit task more difficult and pricy? Regarding audit experience previous research shows somewhat contradictory results. Due to specific characteristics, such as the subsidy system, cost accounting consequences, complex medical care situation, the occurrence of non-exchange transactions, external auditing in hospitals necessitates experience. On the one hand experience could lead to higher fees since the experienced auditor is able to obtain an audit

^{*} The authors are from Ghent University and HUBrussels. They gratefully acknowledge the support of Belgian hospitals and the Institute of Belgian Registered Auditors (IBR) filling in an important data gap.
e-mail: dave.vanderbeke@ugent.be, johan.christiaens@ugent.be, sandra.verbruggen@hubrussel.be

fee premium (Craswell et al., 1995), on the other hand experience could reduce the audit fee in that the experienced auditor is able to conduct the audit more efficiently and can transfer partly this efficiency to the auditee by allowing a lower fee (Cairney & Young, 2006). Using the classical OLS-strategy, answers to these questions were found. By adopting this ordinary least squares technique the unknown parameters can be revealed in a (multiple) linear regression model. Both variance of the model and individual impact of the explanatory factors were assessed this way.

Ultimately the results revealed that the hospital status (and thus the overhead cost) does play a significant role in determining the price of the audit. So higher overhead costs lead to higher fees since there are more operating expenses such as labor costs, supplies and utilities.

Furthermore, the number of assignments of the registered auditor is a significant indicator. The more specialized an auditor is, the lower the price is set. This is possible due to growing work efficiency or lowballing. Furthermore, the hospitals' perception of external auditing can explain the lower fee as well. Historically the audit price for a hospital has initially been set low in the Belgian market (25 euros per bed). A lower importance and appreciation of financial audit from the hospital perspective therefore must be kept in mind. Overall the pricing model was found to be strong and parallel to non-profit studies (cf. Vermeer et al., 2010; Verbruggen et al., 2011).

Although the current study succeeds in delivering new insights in the relatively new domain of nonprofit sector audit fees, there are limitations to the study. Due to the complex process of data collection and lacking data, the number of hospitals under study is rather limited.

Furthermore, the impact of internal audit for example is a yet undiscovered topic in hospital audit studies. Finally, the lower fees by specialist auditors need to be reassessed in order to determine whether they are the results of efficiency effects or lowballing. Given the fact that audit fees have only recently been made public in Belgium, future studies can also investigate the effect of price competition in this relatively specialized audit market. To this extent, the current study is an important starting point.

Introduction

Financial auditing implies the assurance in terms of true and fair view by the financial statements of an organization. Registered auditors are ordered to complete the audit assignment. Unlike internal audits the auditors are independent from the organization or the auditee. Before starting the audit assignment, the auditor agrees contractually on a fixed audit fee.

Over the past decades audit fee determinants have been studied many times, mostly in the profit sector context. At this moment the number of non-profit audit studies is fairly scarce. The New Public Management (NPM) and its adoption in renewed regulations have led towards the professionalization of the non-profit market and a growing interest in audit studies. The NPM was the motive towards an accrual accounting system and an increased responsibility. A raising importance of performance as well as the use of management tools from the profit sector were consequences of the new regulations. Since there are so few publications of non-profit audit studies, much evidence is yet undiscovered. Audit pricing models have been tested in a wide range of sectors – exclusively the profit – in order to find out the influence of sector specific characteristics (auditee and auditor size, inherent risk, auditor specialization,...). There is an important lack of evidence considering the socio-medical sector. This will be the central theme of the current study in which following research questions are set forward. To what extent do the previous researched factors explain the audit price (y-value) in a hospital setting? Are there any important differences?

Simunic (1980) was one of the first researchers examining the explanatory factors considering audit fees in business enterprises. His research resulted in 3 main determinants: the size of the auditee (the institution being audited), the complexity of the auditee and the audit risk. On top of the main group Simunic found several additional determinants, such as being a Big 8¹ (nowadays Big 4) firm. This latter determinant was found to tend towards lower audit fees due to scale economies. This influential work was and still is a milestone in audit research and has inspired many others to continue the search for audit fee determinants in for profit and non-profit settings. In the next chapter a more detailed overview is being offered.

Today non-profit audit fee research is starting to play a more significant role. A recent study of Verbruggen et al. (2011) focuses on the whole Belgian NPO sector, testing commonly known determinants as well as some added sector specific determinants (donations, subsidies, subsectors). To some extent the current study is a sequel of her study in that the current study attempts to explain the audit fee specifically in the hospital sector being an important part of the non-profit sector.

Using the so-called OLS technique, typical fee determinants as well as certain hospital specific determinants are being tested. Since large NPO's are obliged to publish their annual

¹ Big N: These accountancy firms are known to have international dominance considering audit, tax, corporate finance, assurance, ... During most part of the 20th century the Big Eight were the largest accountancy firms: Arthur Anderson, Arthur Young & Co, Coopers & Lybrand, Ernst & Whinney, Deloitte Haskins & Sells, Peat Marwick Mitchell, Price Waterhouse and Touch Ross. Later on the Big Six came into play and nowadays the Big Four are the dominant firms: PWC, Deloitte, Ernst & Young and KPMG. Earlier companies have merged leading to a smaller number of BIG N firms.

financial statements in the Central Balance Office of the National Bank of Belgium, many financial data can be retrieved this way. According to the Belgian accounting legislation, the Notes should disclose the agreed audit fee. However, only few hospitals disclosed the price in their Notes. By cooperating with the Belgian Institute of Registered Auditors most of the lacking fees have been traced.

This paper consists of six sections. The first section draws a historical overview of audit fee evidence. Consecutively both purpose and associated hypotheses are being outlined. Section three focuses on the applied research method. The fourth section describes the several data sources of this study offering the opportunity of data triangulation. This is followed by an overview of all study variables in section five. The final section explains the preliminary conditions leading to the data analysis. Ultimately study limits as well as advice for future research are being pointed out.

Previous research

To this day a number of audit fee studies have been performed almost only regarding the profit sector leading to a notable amount of evidence. Today only a very limited number of studies considering fees in the non-profit market have been performed. Except from Bassioudis et al. (2005), Vermeer et al. (2009) and Verbruggen (2011), no major non-profit studies have been performed. Moreover these studies were often limited to evidence of the NPO market as a whole. That is why the focus on hospitals as a sector makes this study most interesting.

Palmrose (1986) investigated the specific role of the larger audit firms being the Big 8 at that time. Contrary to Simunic (1980), she concluded that there is a significant association between auditor size and audit fee by using a dummy variable (Big 8/non-Big 8). Instead of following Simunic who claimed a tendency towards lower prices due to scale economies, she explains that the Big 8 acts as a cartel implying pricier audits.

In the UK Chan et al. (1993) focused on the determinants of the fee of companies quoted on the stock exchange. Based on earlier findings and a semi-structured interview with four large audit firms, they created a pricing model by performing a multivariate analysis. Apart from known variables such as auditee size, report lag,..., three new explanatory variables appeared to be significant: auditee diversification, structure of the auditee property and whether or not having an audit setting in London. Using the findings of Simunic and other earlier studies, authors kept searching after new explanatory variables and adapted the fee model to a wide range of profit industries. Willekens and Gaeremynck (2005) sketched the price setting in the

Belgian enterprise audit market and started off by making a valuable summary of all (profit) audit fee studies between 1980 and 2005.

Although profit evidence is inexhaustible, there are only a handful of non-profit studies considering audit fees. In the following paragraphs the main findings of non-profit evidence are being outlined. Beattie et al. (2001) published a remarkable article on audit fees. For the first time in history a model of audit fee determinants was developed to investigate the charity sector in the UK. In order to do so, three typical charity variables were added to the common fee model: nature (grant-making versus fund-raising), area of activity and importance of trading income. Secondly – unlike the private market - the smaller concentration of charities permitted a more powerful test to investigate the fee premiums of Big-N firms. In a more complex audit environment of fund-raising charities (former) Big 6 companies receive a higher fee than non-Big 6 auditors. By performing a size- and type-matched comparison between charities and private companies, the audit fee was found to be significantly lower in a charity setting. It is approximately the half of the average private company. Prudence is called for when similar comparisons between different sectors are performed. Every sector has its unique characteristics, which makes it more difficult to compare them with each other.

In 2005 Bassioudis and Ellwood used the audit fee model of Simunic as a basis to investigate the audit fee market for National Health Service (NHS) Hospitals in England and Wales. The results of the study are contradictory to earlier research in the private market. Financial loss does not automatically lead to higher NHS audit fees. The fact that the government owns NHS trusts or that transitional funding often masks poor financial statements may be an explanation for this unique outcome. Auditor tenure also has a rather small impact. The main reason for these remarkable findings is the fact that the NHS audit market is regulated by the Audit Commission and has several unique features. External auditors have to undertake performance studies and are strictly limited considering the amount of further work. The English NHS market is a classic example of how audit markets can vary across different nations.

A typical aspect of the non-profit market and especially the healthcare sector is resource dependency. Without their funds, hospitals would not be able to function properly. But what is the impact of this important factor on the audit fee? Vermeer et al. (2009) performed an interesting study, examining the American non-profit institutions. Apart from the well-known determinants of an audit fee model, they also investigated the role of resource dependency. As hypothesized, non-profit organizations depending on funds do include a higher audit risk

and/or additional audit monitoring activities, which leads to a pricier audit. Furthermore results showed that alternative monitoring mechanisms (cf. internal audit) are complements rather than substitutes for audit monitoring by an external auditor.

Furthermore resource dependency has also been examined in the Belgian non-profit market. Van Caneghem et al. (2011) performed a survey considering governmental grants in the Belgian non-profit market. Hereby the focus was mainly put on resource dependency. No less than 55 percent of the respondents indicated the utility of an external audit to justify governmental grants. The financial and governmental audits were indicated to be complementary. It was Verbruggen (2011) who investigated the Belgian non-profit market for the first time ever considering audit studies. After analyzing the data of over 500 NPO's, results were found to be opposite to the earlier findings of Van Caneghem and Vermeer. Dependence on governmental funds does not significantly explain the variance in audit fee levels. Several explanations can be given: subsidies do not increase the fee; the government does not pay any attention to financial audit information in the procurement process; only governmental auditors can audit subsidies; audit clients are not convinced of the fact that a higher audit quality is important to receive or justify subsidies.

Research question-hypotheses

The main goal of this paper is to verify to what extent the general approach made by previous research (cf. Verbruggen, 2011) is transferable to the particular context of a hospital setting. Hospitals do have a very important societal function providing health care which cannot be set forward in the profit sector. A huge amount of money comes into play requiring subsidies (e.g. public money) to operate optimally. The hospital audits are adopted to perform an accountability test, controlling whether the subsidies are well spent. Moreover the complexity of its production process makes a hospital unique and most interesting.

To what extent does the outcome of a hospital audit fee model differ from the classic NPO (cf. Verbruggen, 2011)? Is the impact of the known explanatory variables similar? Are there any specific hospital features and what is there impact on the audit fee?

Hypotheses

As stated earlier, this paper was an opportunity to find out to what extent previous study findings are transferable to an important cluster of hospitals. On the one hand hospitals are similar to NPO's to certain extent (since they are a subsector), on the other hand hospitals do also have additional proper features making them a unique setting with a typical financial

structure. What follows is an overview of the study hypotheses supported by previous research.

Client size is a well-known determinant in audit pricing studies. Evidence of previous studies has shown its positive impact on the audit fee. Hay et al. (2006) performed a meta-analysis of audit fee determinant studies. One of the conclusions was that the client size is the most important explanatory factor. Magnitude involves more complexity, which ultimately leads to a higher fee.

H1: The size of the hospital indicates the fee

Furthermore evidence also reveals that size matters when considering the audit firm. DeAngelo (1981) stated that auditor size and quality are strongly related. Differences in Big4 and non-Big4 capture differences in audit quality. Contrary to this traditional view Vander Bauwhede et al. (2004) could not find any evidence supporting quality differentiation in the private client segment of the Belgian audit market. Choi et al. (2010) performed a large-scale study over a period of five years (2000-2005). Main goal of the study was to find out in what way the size of a local audit office has an impact on audit quality and/or audit fee. Even after controlling on national level and expertise degree, results confirmed the significant positive relation between size and audit quality. Moreover auditor size has a positive impact on the fee. Usually a Big 4 dummy is added to investigate the size impact. Although Big 4 firms – such as Ernst & Young – can have a huge impact on the hospital sector, we may not forget about the non-Big 4 auditors. There are also important internationally organized non-Big 4 firms. Therefore, it is recommended to split up the non-Big 4 section into several subgroups (Verbruggen et al., 2011).

What about the healthcare sector? When a Belgian hospital wants a Big 4 company to perform an audit, it will presumably have to open the purse reluctantly. As a cartel the Big 4 companies have a stronger position (Palmrose, 1986) monopolizing the market. But apart from the Big 4 there are also auditor firms with a relatively big size, making the fee pricier.

H2: Larger audit firms receive a higher audit fee

The following two hypotheses (H3 and H4) both consider the complexity of a hospital setting and therefore belong together.

Since there is no direct evidence on the relation between clinical services and fees, it is most interesting to investigate. Nevertheless there is some other related evidence explaining why this number can be an important research issue. In the year 1998 Chang published a valuable

study on hospital determinants and their influence on hospital efficiency in Taiwan. Performing a data envelopment analysis combined with regression, he concluded that service complexity (number of services) is negatively related to hospital efficiency. The bigger the scope of services, the more complex and difficult the task will be to manage the hospital. Apart from management difficulties, we can assume that the audit task will be more complicated as well. The more departments, the more complex the audit will be. This includes a bigger fee.

H3: The number of clinical services is positively related to the audit fee

Although the main part of the analyzed data comes from privately organized non-profit hospitals, there are also some publicly organized university hospitals and social welfare hospitals included as well. The latter two hospital types are special in the sense that they are strongly related to other governmental or private organizations. Whereas a privately organized non-profit hospital can be considered as a whole, university and social welfare hospitals belong to a bigger entity. Social welfare hospitals belong to social welfare institutions. It can be argued that the bigger the entity, the more overhead costs there will be. Overhead costs can be defined as a set of functions trying to guide and support the staff in the primary process: management, personnel and organization, facilities, IT, finances and control, communication and legal aspects. Other descriptions used by authors are indirect costs or secondary activity. Since the latter two are not always the exact same, this may cause some confusion.

Especially in the profit there is existing evidence on the influence of the property form on the audit fee. Companies quoted on the stock exchange for example will be more likely to transform financial statements. Doing some creative accounting will complicate the financial audit. In 1994 O'Keefe et al. concluded that being quoted on the stock exchange leads to more complex audit assignments and higher audit fees.

Overhead costs do complicate the audit task, having to take several units into account. We can presume that the audit price will be elevated if the auditor has to deal with more overhead activity.

H4: Overhead costs are positively related to the audit fee

The New Public Management has lead to a new legislation system, forcing very large NPO's to apply an accrual accounting system and to undergo an external audit. Still, there are many sector regulations, demanding a variety of auditor skills (Christiaens, Vanhee, Verbruggen & Millis, 2008). Apart from the typical factors (such as auditor size, client size, financial

performance, ...), there is a specialization factor influencing the audit process. Over the past decade evidence was mainly mixed. Obviously specialization can have a positive as well as a negative impact on the fee in theory. An audit client may be willing to pay for quality or the signaling effect of hiring a specialist.

Mayhew & Wilkins (2003) defined auditor industry specialization as a combination of market share and differentiation skill within client industries. Making use of Initial Public Offering (IPO) audit fees they suggested that market share enables audit firms gaining competitive advantages considering cost and service. However a strongly differentiated strategy is necessary as well to obtain a stronger bargaining position including fee premiums. Besides it is also possible that specialization leads to an experience effect for the audit firm, implying a lower fee (Cairney & Young, 2006). According to this research team there is a cost-based competitive advantage since the cost of developing expertise can be spread over more clients. An older study (Craswell, Francis & Taylor, 1995) heads towards the opposite direction. Clients are willing to pay a fee premium for a market specialist. Carson & Fargher (2007) added value to earlier research by concluding there is a link between the client size and the given fee premium. This means that NPO's – often a lot smaller than the listed companies – are probably less willing to pay a premium as high as for-profit companies.

Verbruggen et al. (2011) also added a specialization variable to their price model. By applying a combined measure of both market and portfolio share of the audit firm, a weighed measure of auditor specialization could be tested. They hypothesized that the degree of non-profit sector specialization is negatively related to audit fees. After applying an OLS-model, the hypothesis was confirmed. Non-profit organizations do receive a price reduction for non-profit sector specialists. Possible explanations can be: no signaling effect due to stockholder absence, learning effects and lowballing² in a price-conscious market. Continuing on the same line, we can hypothesize that Belgian hospitals pay lower premiums when an audit specialist is performing the external audit.

H5: The degree of hospital specialization of the auditor is negatively related to audit fees

² Lowballing is a pricing technique and persuasion. Companies charge lower prices than actually intended. Eventually they will raise the price resulting in more profit.

Research method

The conventional technique applied in audit fee determinant studies is the least square technique. Even in the early years of fee research (cf. Simunic, 1980) this method has been used. The pricing model is created by solving the typical linear equation. This statistical method is also known as the Ordinary Least Squares (OLS).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \epsilon$$

The Y is the so-called dependable variable, the variable that needs to be explained. The X-values are the independent or explaining variables. The β_0 -value constant acts as a substitute value for all the ‘forgotten variables’. Since some variables are not accessible (for instance due to the lack of public access), there will always be a margin of error. It is the ϵ -value that can be seen as a correction factor. In order to find out how strong a certain model is – in other words how well the X-values explain the Y-value – a determination coefficient R^2 is being calculated. This coefficient has a value going from 0 to 100%. The bigger the R^2 outcome is, the larger the explaining value of the model will be.

Data collection

The annual financial statements of the Belgian hospitals can be seen as the base of this study. Since the New Public Management NPO's (more specific the big and very big non profits) are obliged to hand over their annual statements to the Central Balance Sheet Office of the National Bank of Belgium (NBB), making them publicly. The names of all Belgian hospitals were found on the website of the association of Belgian hospitals (BVZ).

The main issue in the data collection was the fact that there is a mix-up of two different types of financial reporting: on the one hand the general purpose financial reporting (NPO's) and on the other hand there is also a specific type of financial reporting (Federal Public Service). This also explains why ultimately a sample of 71 hospitals were integrated (instead of all 111 Belgian hospitals)

I would like to conclude this chapter by saying that this part of the study was very intense and not to be underestimated. Not all data was centralized in the Central Balance Sheet Office. Moreover there were non-profit hospitals with an incomplete annual statements and therefore are not handed over in the approved manner. Apart from the National Bank, I also used data

from the IBR as a data source. The Institute was a great support and made it possible for me to get access to valuable data required for this study. Hospitals with incomplete annual statements were individually contacted and stimulated to communicate the lacking data. Apart from using these sources to complete my data set, the three sources were also compared to enforce the validity of the findings. Since there was an overlap, the justice of the data could be easily verified. The control of the financial data present in two or more sources was satisfying and thus not alarming. This research technique is also known as data triangulation (Guion et al., 2011).

Defining the variables

Which X variables do have a significant impact on the fee of a Belgian hospital? What are the differences/similarities compared to earlier non-profit evidence? Those are the main questions we want to resolve by adapting the OLS strategy.

The variables X can be divided into three clusters: audit client (the Belgian hospitals in this case), audit firm (Big and non-Big 4) and audit engagement. Each cluster consists of several independent variables. Most X variables are similar to those adopted in earlier research. A few variables are new and typical for the hospital sector. Adding all these values to the pricing model will offer the opportunity to verify the hypotheses and determine the impact – whether or not significant – of all single X variables.

Audit client, the Belgian hospital (H)

In order to work efficiently, each variable is given a first letter of the cluster it belongs to. Hospital variables start with an H, audit firms with an F and engagement with an E. What follows is an enumeration of all variables assessing the risk and complexity of the audit client, the Belgian hospital. The arithmetic method is based on earlier research. I used the PhD of Verbruggen (2011) as a guiding line since it is a very recent article focusing on the NPO sector.

Considering the size of the hospital, several variables can be distinguished. A typical measure is taking the natural log of the total assets (H_LNTA). Moreover the yearly mean of the staff (FTE) has also been implemented as a determinant (H_LNSTAFF). The natural log was used to deal with high levels of skewness. Another possibility – also applied in this study – is measuring the supply of the hospital (H_SUP/TA). Furthermore the accounts receivable on the total assets are scheduled (H_AR/TA). Both short and long term accounts receivable are taken into account (Willekens et al., 2005; Verbruggen et al. 2011).

Moreover there are some typical financial measures added to the pricing model in order to assess the audit risk: profitability (H_PROF), leverage (H_LEV), current ratio (H_CR) and subsidies (H_SUB). The latter variable deserves some particular attention. The subsidies are calculated by adding up accounts 700 and 701 of the annual statements. Account 700 is the price of hospitalization (calculated per day) and account 701 covers the outstanding amounts. Outstanding amounts are surplus or deficit receipts regarding to the Budget of Financial Means (BFM) settled for the current financial year (1st of July until 30th of June). As stated in the Royal Decree the BFM covers all costs considering hospital stay in a joint room, care delivery to the patients including daycare.

To top off this list a dummy variable considering the hospital status is created (H_STATDUMMY). Is the hospital a typical NPO or is it a social welfare/university hospital? Since the latter two include more units, the audit is expected to be more complex and pricier.

Audit firm (F)

Traditionally audit studies add a Big 4 dummy to investigate the role of the audit firm size. PriceWaterhouseCoopers, Deloitte Touche Tohmatsu, Ernst & Young and KPMG are considered to be the biggest auditors, having an enormous impact on the market. Nevertheless there are also huge non-Big 4 offices (cf. BDO & RSM Interaudit) that have a considerably larger impact compared with smaller non-Big 4 audit firms. Therefore the size of the firms has been divided in three sections: small, moderate and Big 4 settings. Subsequently the experience of the commissioner is added (F_EXP). By simply subtracting the year of taking the oath from the fiscal year, the years of experience were being exposed. To measure the audit specialization, the number of hospital engagements by each commissioner or partner is calculated (F_ENGAG). In his publication De Beelde (1997) has already stated that audit concentration is variable across countries and industries when he compared large audit companies situated in 14 countries. He also concluded that differences between audit firms do exist according to their specialist and generalist nature.

Audit engagement (E)

The report lag is a good indicator of the audit engagement (E_REPLAG). It is the time between the end of the accounting period and the day of the audit report. The longer this period lasts, the busier the auditor is which ultimately leads to a higher audit cost.

Typical a dummy variable for the decision of the audit is added (E_UNQUAL). The result may be unqualified or not. An unqualified decision means that everything is perfectly fine and in line with reality. In the other case, there are some obscurities that need to be verified. This makes the auditor task more difficult and pricy.

Hospital Variables

<i>Hospital Variable (H)</i>	<i>Arithmetic method</i>	<i>Expectation/relation to audit fee</i>
HLNTA (size) <i>Total Assets</i>	<i>Natural Log (skewness)</i>	+
HLNSTAFF (size) <i>Mean of yearly staff FTE</i>	<i>Natural Log (skewness)</i>	+
HPROFIT <i>Profitability</i>	<i>Profit/TA</i>	-
HLEV <i>Leverage</i>	<i>Leverage/TA</i>	+
HARI <i>Accounts Receivable and Inventories</i>	<i>(ARshort + ARlong + Inventory)/TA</i>	+
HSTAT <i>Hospital Status</i>	<i>Privately organized NPO (0) or Publicly organized Social Welfare/University Hospital (1)</i>	<i>Higher fee when status other than NPO</i>
HCR <i>Current Ratio</i>	<i>(Supply + Accounts Receivable more than 1 year + Investments + Liquid + Prepayments and Accrued Income) / (Leverage lower than 1 year + Accruals and Deferred Income)</i>	-
HSUB <i>Subsidies</i>	<i>Price Day of Hospitalization + Outstanding Amounts</i>	+
HSPEC <i>Service Complexity</i>	<i>Number of Hospital Services</i>	+

Audit Firm Variables

Audit Firm Variable (F)	Arithmetic method	Expectation/relation to audit fee
FSize Firm Size	Small (0) and Medium (1) and Large (2)	Larger size = higher fee
FEXP Experience of Auditor	Difference between Financial Year and Date of taking the Oath	-
FENG Engagements of auditor	Number of hospital audits per partner	-

Audit Engagement Variables

Audit Engagement Variable (E)	Arithmetic method	Expectation/relation to audit fee
EREPLAG Audit Report Lag	Difference between Annual Report Deposit/Audit report and the end of the Financial year (in days)	+
EUNQUAL Final Audit Statement	Unqualified (0) versus other than unqualified (1)	Fee higher when statement other than unqualified

Results and discussion

Preliminary conditions

Ultimately 71 full hospital records were included in the study. When performing an analysis it is important to first control the quality of the dataset. Are there any abnormalities considering data range, extreme values, etc.? As a matter of fact there are three main conditions that need to be fulfilled before the actual linear regression can take place: control of descriptive statistics, normality check and multicollinearity analysis. As displayed in table 6 the descriptive statistics of all 12 variables (including dependable variable) don't show any oddities at first sight and seem rather plausible. What about the HCR maximum? Although a current ratio can be quite high (for example when having a big supply or a small short-term debt), the range of 81 does attract attention. Possible extreme values like these might create more skewness in the data distribution.

Descriptive statistics

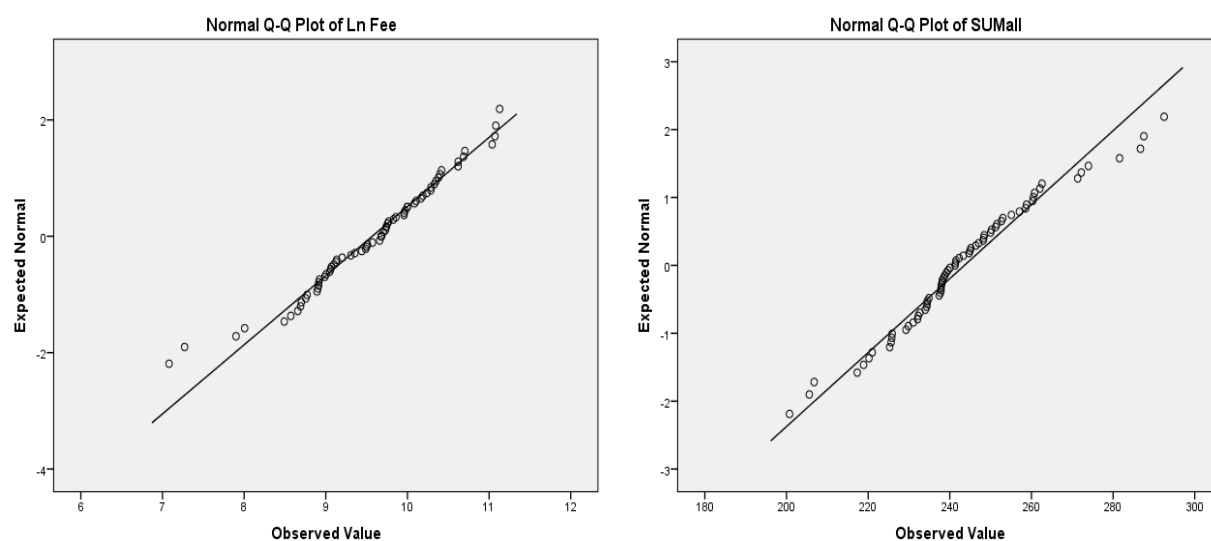
	<i>Range</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
<i>HStat</i>	1	0	1	,08	,28
<i>Ln HTotalAssets</i>	4,15	15,64	19,80	18,32	,95
<i>HLNStaff</i>	3,62	4,83	8,46	6,57	,88
<i>Hprof / HTA</i>	,29	-,08	,21	,02	,03
<i>HLev / HTA</i>	2,15	,23	2,38	,57	,26
<i>(HAR1+HAR2+HSup)/HTA</i>	2,82	,03	2,85	,34	,33
<i>HCR</i>	81	,26	81,26	3,57	10,33
<i>HHospspec</i>	9	1	10	5,63	2,34
<i>FSize</i>	2	0	2	,52	,79
<i>FExperience</i>	35	1	36	21,00	7,32
<i>FEngagement</i>	6	1	7	2,97	1,71
<i>EReportlag</i>	113	135	248	185,24	19,78
<i>EUnqualdummy</i>	1	0	1	,23	,42
<i>Ln Fee</i>	4,05	7,08	11,13	9,56	,83

Valid N (listwise) = 71

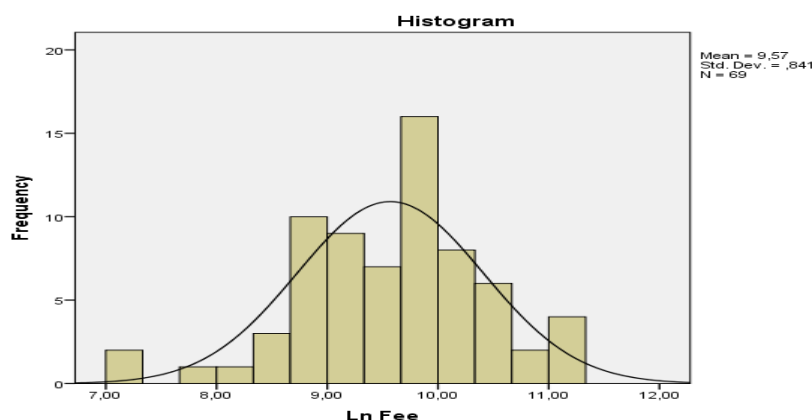
What happened to the variable HSub (hospital subsidy)? Accordingly to previous research (cf. Verbruggen, 2011) resource dependency and thus governmental financing does play an important role in NPO's. This is also the case within the Belgian hospital sector. Still there are huge differences between a classic non-profit subsidy and a hospital subsidy. The latter one is not the typical non-exchange transaction as in the regular non-profit. In a Belgian hospital, a

subsidy has to be seen as an exchange transaction because a hospital service is being delivered in return. Moreover – apart from the price hospitalization and the outstanding amounts – hospitals do also receive smaller subsidies such as donations, legacies, subsidies on capital and interest, ... Therefore it is very difficult to detect and capture all this information on subsidies. Due to these reasons the hospital subsidy was eventually removed from the data set.

Are the data normally distributed? The Q-Q plots of both fee and independent variables reveal the normality of the dataset.



In addition the following histogram of our Y value (audit fee) is being displayed below.



The last step before heading towards the analysis is the multicollinearity checkup. What results does a bivariate correlation test show? Both assets and hospital specialization (number of services) had a correlation of over 60 percent with the hospital staff and were removed from the data set. From this moment on the data set was ready to perform the actual regression analysis.

Data analysis, multiple linear regression

Similar to Verbruggen et al. (2011) the OLS technique is used to clarify the impact of the variables X (hospital, audit firm and engagement variables) and the dependent variable Y (ln fee). What percentage of the variance in Y can be explained by the set of independent variables? Is the model significant at all? Which independent variables do have a significant impact on the audit price? What does the final linear equation look like?

After performing the data analysis, these results were shown on the SPSS output:

Model Summary

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>	<i>Change Statistics</i>				
					<i>R Square Change</i>	<i>F Change</i>	<i>df1</i>	<i>df2</i>	<i>Sig. F Change</i>
<i>1</i>	<i>,821</i>	<i>,674</i>	<i>,611</i>	<i>,52496</i>	<i>,674</i>	<i>10,697</i>	<i>11</i>	<i>57</i>	<i>,000</i>

Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	3,10	1,05	2,96	,005
	HStat	-,94	,32	-,32	,004
	HLNStaff	,80	,09	,84	,000
	Hprof / HTA	-,98	2,22	-,04	,659
	HLev / HTA	,46	,28	,14	,110
	(HAR1+HAR2+HSup)/HTA	-,17	,23	-,07	,454
	HCR	,02	,02	,01	,394
	FSize	,24	,09	,22	,012
	FExperience	,01	,01	,05	,592
	FEngagement	-,10	,04	-,20	,022
	EReportlag	,01	,00	,15	,107
	EUnqualdummy	-,34	,18	-,17	,061

The model is significant is significant at the 1% level ($p < 0,001$) as shown by the ANOVA or analysis of variance ($F=10,697$). This means that the model is strong and that the set of independent variables as a whole is a good predictor of the audit fee. Moreover the adjusted R square value is very satisfying. No less than 61,1% of the variance in Y is explained by the set of variables X. What about the impact of each separate variable X? After applying the OLS technique, four independent variables were found to have a significant impact on the fee: hospital status, hospital staff, audit firm size and number of engagements of the commissioner.

When implementing the standardized beta values, the linear equation can be completed:

$$\ln Fee = -0,315 HStat + 0,84 HLnStaff - 0,035 HProf + 0,143 HLev \\ -0,069 HARI + 0,094 HCR + 0,224 FSize + 0,049 FExp \\ -0,199 FEng + 0,145 ERepLag - 0,169 EUnqDum$$

What does this result mean? What effect does this outcome have on the hypotheses in table two? What follows is a brief summary of the impact of each separate independent variable.

Six hospital variables have been added to the model. The variable *HStat* was implemented to find out whether overhead costs do complicate the audit assignment, increasing the audit price (H5). Results show that *HStat* has a significant impact (p at 5 percent level) on the fee, supporting the fifth hypothesis. Since no similar evidence has been found considering the impact of hospital status on its fee, a new variable can be added in the existing set of hospital fee determinants (theory building). The second variable *HLnStaff* is also a significant predictor of the audit fee (p at 1 percent level). This does not come as a surprise. Since the hospital staff is strongly related to the total assets and is a good size indicator, we could expect a good link with the fee. The rest of the hospital variables (profitability, leverage, accounts receivable/inventory and current ratio) do not have a significant impact on the audit price. Although these variables do not have significant p values, they do help explain the variance in the fee (Y) and therefore are also added to the linear equation above.

Apart from the client characteristics, the audit firm and engagement are also taken into account. Two firm variables were found to have a significant impact at the 5 percent level: *FSize* and *FEng*. In other words, the two hypotheses we wanted to test in table 2 are supported. H1 stated that larger audit firms imply pricier audits. Instead of using the classic dummy, this study divided the firms in three groups: small, medium and large audit firms (cf. 5.2. defining variables section). The bigger the audit firm, the pricier the fee will be. H2 stated that hospital specialization has a negative impact on the fee. The study results do support H2 as well. The more audit engagements a commissioner has, the less pricey the fee will be. No significant link was found between auditor experience (*FExp*) and audit price. The latter two independent variables added to the model were the engagement variables. According to the results, the report lag and the conclusion of the commissioner (unqualified or not) do not have a significant impact on the fee.

In brief we can infer that all hypotheses from table 2 are supported, except for H4. Since hospital specialization correlated for over 60 percent with the variable *HLnStaff*, the variable *HSpec* was removed from the data set (cf. 7.1, preliminary conditions).

Conclusions and issues for further research

This paper adds value to existing audit fee research, since it is the first time that determinants in the specific sector of hospitals have been investigated, except for a study in the UK where the emphasis was put on NHS hospitals (Basioudis & Ellwood, 2005). Hence, current study has international significance, since evidence considering audit fees in the health sector is rather limited. Contrary to typical NPO publications current study also included hospitals established by governments, i.e. social welfare and university hospitals. This study also took these hospitals into account, investigating the impact of overhead costs. By investigating the relationship between hospital status and audit fee, we add an interesting and yet undiscovered feature to existing audit fee evidence.

Hospital status has a significant impact on the fee. Why would social welfare and university hospitals have to pay more than a classic non-profit hospital? Again the explanation is not far away. Social welfare (or article XII) hospitals have strong connections with their local social welfare institution. This latter unit plays an important role considering management and control of its hospital(s). This implies that when performing an audit of a social welfare hospital, more overhead costs have to be taken into account. The same may be said for university hospitals. They too are linked to another institute that is the university itself. Whilst non-profit hospital audits only have to take one unit into account, social welfare and university hospital audits are more complicated since more units are involved. Overall it can be stated that publicly organized hospitals are governmental institutions. Therefore more regulations and social goals come into play ultimately leading to more overhead costs, more complex audits and higher fees.

Apart from the hospital size, audit firm magnitude also significantly determines the fee. Since many earlier studies report an important impact of the firm size on the fee (DeAngelo, ...), this result does not come as a surprise. There are also medium sized firms having a larger impact on the price comparing to the smaller ones (cf. BDO & Interaudit).

The latter variable that is significantly related to the fee is the auditor specialization captured by the number of hospital audits by commissioner. Although evidence is rather mixed, there is a tendency towards a negative impact. Verbruggen (2011) mentioned the bargaining power of the auditor. When an auditor has more assignments in a particular market segment and is more specialized, he is able to lower the audit price due to grown work efficiency. This means that commissioners with a high number of hospital assignments set a lower price than those with less hospital audits. Furthermore the perception of the audit can have an impact as well.

Nowadays hospitals do not fully understand and valorize audit. Therefore auditor specialists do not receive a higher fee. Since the Federal Public Service only subsidized 25 euros per hospital bed, hospitals were urged to guard the fee and limit the fee as much as possible.

Audit opinion and report lag are very important to hospitals because they financially depend on the government. The government can be seen as a supervisory institute, controlling the overall functioning of the hospitals. As long as these latter ones can prove sufficient quality, they receive subsidies as a financial support. Furthermore the birth of the New Public Management has put more pressure on the non-profit, stimulating the market to be more transparent. Economy, Efficiency and Effectiveness (three E's) are brought into prominence. Both the government and the New Public Management force the Belgian non-profit to offer assurance. Therefore audit opinion and report lag also play an important role in determining the audit fees in the Belgian hospitals. The fact that also the impact of hospital leverage (long- and short-term debts) tends towards significance could be expected as well. Unlike Vermeer et al. (2009) who studied American NPO's, leverage does drive the inherent risk of the hospital audit and thus the fee. Again the new legislative system and the monitoring government come into play.

The OLS analysis already led to a valuable 61,1 percent with a small, but diversified dataset. Still several possible determinants have not been implemented in the model: internal control of the hospital (audit committee), prestige, audit partner effect, ... According to Hogan et al. (2008) ICD or Internal Control Deficiency firms do pay more for the external audit. Well functioning audit committees can spot and eventually resolve audit difficulties in an early stage, making the external audit less difficult. It can be hypothesized that a high level of internal control leads to lower audit fees. Prestige is a rather difficult determinant to capture that may have an impact on the audit fee. Since the number of university hospitals is fairly low in Belgium, some commissioners may be willing to (seriously) lower their audit price. They may find it a great achievement to be the number one auditor of a well-known hospital. Another interesting aspect of an audit relation is the audit partner effect. During the European study day (IBR) J. Van Buuren – associate professor in accounting at Nyenrode Business University – talked about the PhD he presented in 2009. After a thorough investigation of the audit partner effect within Dutch companies noted on the stock exchange, he concluded that an audit assignment must be seen as an organic and dynamic event. Human capacity and behavior certainly play a role as well.

References

- Basioudis, I., & Ellwood, S. (2005). An empirical investigation of price competition and industry specialisation in NHS audit services. *Financial Accountability and Management* , 2 (21), 219-250.
- Beattie, V., Goodacre, A., Pratt, K., & Stevenson, J. (2001). The determinants of audit fees-evidence from the voluntary sector. *Accounting and Business Research* , 4 (31), 243-274.
- BVZ. *Belgische Ziekenhuizen*. Retrieved 2011-2012, from Belgische Vereniging der Ziekenhuizen: www.hospitals.be
- Cairney, T. D., & Young, G. R. (2006). Homogenous industries and auditor specialization: an indication of production economies. *Auditing: a Journal of Practice and Theory* , 1 (25), 49-67.
- Carson, E., & Fargher, N. (2007). Note on audit fee premiums to client size and industry specialization. *Accounting and Finance* , 3 (47), 423-446.
- Chan, P., Ezzamel, M., & Gwilliam, D. (1993). Determinants of audit fees for quoted UK companies. *Journal of Business Finance and Accounting* , 6 (20), 765-786.
- Chang, H. (1998). Determinants of hospital efficiency: the case of central government-owned hospitals in Taiwan. *Omega International Journal of Medicine Science* , 2 (26), 307-317.
- Choi, J.-H., Kim, C. F., Kim, J.-B., & Zang, Y. (2010). Audit office size, audit quality, and audit pricing. *Auditing: a Journal of Practice and Theory* , 1 (29), 73-97.
- Christiaens, J., Vanhee, C., Verbruggen, S., & Millis, K. (2008). Verenigingen en stichtingen: vergelijkend en empirisch onderzoek van de boekhoudregelingen. *Die Keure* , 79.
- Craswell, A. T., Francis, J. R., & Taylor, S. L. (1995). Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* , 3 (20), 297-322.
- De Angelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics* , 3 (3), 183-199.
- De Beelde, I. (1997). An explanatory investigation of industry specialisation of large audit firms. *The International Journal of Accounting* , 3 (32), 337-355.
- De Beelde, I. (2008). Financial Audit. *Academia Press* , 297.
- Guion, L. (2002). Triangulation: establishing the validity of qualitative studies. *University of Florida - Extension* , 3.
- Hay, D. C., Knechel, W. R., & Wong, N. (2006). Audit fees: a meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research* , 1 (23), 141-191.
- Hogan, C. E., & Wilkins, M. S. (2008). Evidence on the audit risk model: Do auditors increase audit fees in the presence of internal control deficiencies? *Contemporary Accounting Research* , 1 (25), 219-242.
- IBR. (n.d.). *Register en Lijsten*. Retrieved 2011-2012, from Institute of Registered Auditors: www.ibr-ire.be
- Mayhew, B. W., & Wilkins, M. S. (2003). Audit firm industry specialization as a differentiation strategy: evidence from fees charged to firms going public. 2 (22), 33-52.
- Mellett, H., Peel, M., & Karbhari, J. (2007). Audit fee determinants in the UK university sector. *Financial Accountability & Management* , 2 (23), 155-188.
- NBB. *Jaarrekeningen Raadplegen*. Retrieved 2011-2012, from Nationale Bank van België: www.nbb.be
- O'Keefe, T. B., Simunic, D. A., & Stein, M. T. (1994). Industry differences in the production of audit services. *Auditing: a Journal of Practice and Theory* , 1 (13), 128-142.
- Palmrose, Z. (1986). Audit fees and auditor size: further evidence. *Journal of Accounting Research* , 1 (24), 97-110.
- Simunic, D. A. (1980, Spring). The pricing of audit services: theory and evidence. *Journal of Accounting Research* , 161-190.

- Van Buuren, J. (2012). European Study Day: The quality of external audit, a lever for the European economy. *On the nature of auditing: The audit partner effect* (p. 247). Brussels: Nyenrode Business Universiteit.
- Verbruggen, S., Reheul, A.-M., Van Caneghem, T., Dierick, J., Christiaens, J., & Vanhee, C. (2011). Het bedrijfsrevisoraat in de verenigingssector. *Brugge: Die Keure*, 292.
- Vander Bauwhede, H., & Willekens, M. (2004). Evidence on (the lack of) audit-quality differentiation in the private client segment of the Belgian audit market . *European Accounting Review* , 3 (12), 501-522.
- Verbruggen, S. (2011, June). Non-profit organizations: financial reporting, auditing and earnings management. *PhD* , 81-118.
- Verbruggen, S., & Christiaens, J. (2011). Audit pricing in a reformed nonprofit market. *Ghent University Working Paper* (Nr. 2011/764), 34.
- Vermeer, T. E., Raghunandan, K., & Forgione, D. A. (2009). Audit fees at U.S. non-profit organizations. *Auditing: a Journal of Practice and Theory* , 2 (28), 289-303.
- Willekens, M., & Gaeremynck, A. (2005). Price-fixing in the Belgian audit market. *Die Keure* , 111.